

Metallized Polypropylene (PP) Capacitors in PCM 7.5 mm to 37.5 mm. Capacitances from 1000 pF to 10 µF. Rated Voltages from 100 VDC to 2000 VDC.

Special Features

- High volume/capacitance ratio
- Self-healing
- Very low dissipation factor
- Negative capacitance change versus temperature
- Very low dielectric absorption
- According to RoHS 2011/65/EU

Typical Applications

For high frequency applications e.g.

- Sample and hold
- Timing
- Oscillating circuits
- High frequency coupling and decoupling

Construction

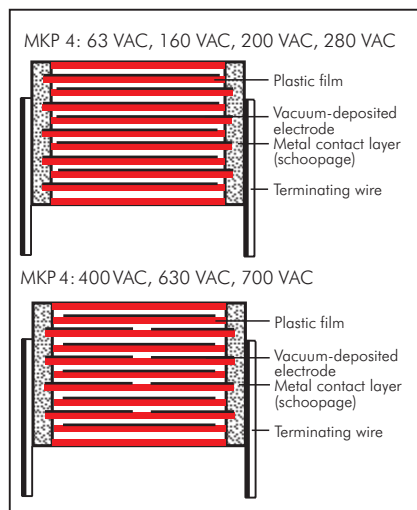
Dielectric:

Polypropylene (PP) film

Capacitor electrodes:

Vacuum-deposited

Internal construction:



Encapsulation:

Solvent-resistant, flame-retardant plastic case with epoxy resin seal, UL 94 V-0

Terminations:

Tinned wire.

Marking:

Colour: Red. Marking: Black.
Epoxy resin seal: Red

Electrical Data

Capacitance range:

1000 pF to 10 µF (E12-values on request)

Rated voltages:

100 VDC, 250 VDC, 400 VDC, 630 VDC,
850 VDC, 1000 VDC, 1600 VDC, 2000 VDC

Capacitance tolerances:

±20%, ±10%, ±5%

Operating temperature range:

–55° C to +100° C

Climatic test category:

55/100/56 in accordance with IEC

Insulation resistance at +20° C:

$C \leq 0.33 \mu\text{F}$: $\geq 1 \times 10^5 \text{ M}\Omega$

(mean value: $5 \times 10^5 \text{ M}\Omega$)

$C > 0.33 \mu\text{F}$: $\geq 30\,000 \text{ sec (M}\Omega \times \mu\text{F)}$

(mean value: 100\,000 sec)

Measuring voltage: 100 V/1 min.

Maximum pulse rise time:

Capacitance pF/µF	max. pulse rise time V/µsec at $T_A < 40^\circ \text{C}$							
	100 VDC	250 VDC	400 VDC	630 VDC	850 VDC	1000 VDC	1600 VDC	2000 VDC
1000 ... 2200	–	–	–	–	2200	2200	3500	5200
3300 ... 6800	–	–	–	–	1150	1150	2700	3500
0.01 ... 0.022	450	450	450	500	550	550	1800	2700
0.033 ... 0.068	250	250	300	350	400	400	900	1800
0.1 ... 0.22	150	150	200	250	300	300	500	900
0.33 ... 0.68	100	100	150	200	200	200	–	–
1.0 ... 2.2	75	100	100	150	150	150	–	–
3.3 ... 4.7	60	100	100	120	140	140	–	–
6.8 ... 10	40	50	60	85	–	–	–	–

for pulses equal to the rated voltage

Dissipation factors at +20° C:

$\tan \delta \leq 10 \times 10^{-4}$ at 1 kHz

Test specifications:

In accordance with IEC 60384-16

Test voltage: $1.6 U_r$, 2 sec.

Dielectric absorption: 0.05%

Voltage derating:

A voltage derating factor of 1.35 % per K must be applied from +85° C for DC voltages and from +75° C for AC voltages.

Reliability:

Operational life > 300\,000 hours

Failure rate < 2 fit ($0.5 \times U_r$ and 40° C).

Mechanical Tests

Pull test on pins:

$d \leq 0.8 \phi$: 10 N in direction of pins

$d > 0.8 \phi$: 20 N in direction of pins

according to IEC 60068-2-21

Vibration:

6 hours at 10...2000 Hz and 0.75 mm displacement amplitude or 10 g in accordance with IEC 60068-2-6

Low air density:

1 kPa = 10 mbar in accordance with IEC 60068-2-13

Bump test:

4000 bumps at 390 m/sec²
in accordance with IEC 60068-2-29

Packing

Available taped and reeled up to and including case size 15 x 26 x 31.5 / PCM 27.5 mm.

Detailed taping information and graphs at the end of the catalogue.

For further details and graphs please refer to Technical Information.

Continuation

General Data

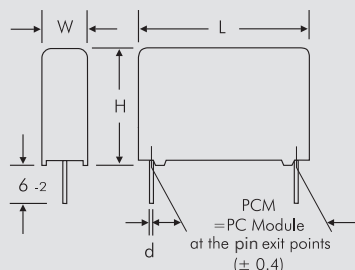
Capacitance	100 VDC/63 VAC*					250 VDC/160 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
0.01 μ F	3	8.5	10	7.5	MKP4D021002B00_____	3	8.5	10	7.5	MKP4F021002B00_____
0.015 "	3	8.5	10	7.5	MKP4D021502B00_____	3	8.5	10	7.5	MKP4F021502B00_____
0.022 "	3	8.5	10	7.5	MKP4D022202B00_____	3	8.5	10	7.5	MKP4F022202B00_____
0.033 "	3	8.5	10	7.5	MKP4D023302B00_____	3	8.5	10	7.5	MKP4F023302B00_____
0.047 "	4	9	13	10	MKP4D023303C00_____	4	9	13	10	MKP4F023303C00_____
	4	9	10	7.5	MKP4D024702C00_____	4	9	10	7.5	MKP4F024702C00_____
	4	9	13	10	MKP4D024703C00_____	4	9	13	10	MKP4F024703C00_____
0.068 "	4	9	10	7.5	MKP4D026802C00_____	4	9	10	7.5	MKP4F026802C00_____
	4	9	13	10	MKP4D026803C00_____	4	9	13	10	MKP4F026803C00_____
0.1 μ F	4.5	9.5	10.3	7.5	MKP4D031002D00_____	4.5	9.5	10.3	7.5	MKP4F031002D00_____
	4	9	13	10	MKP4D031003C00_____	4	9	13	10	MKP4F031003C00_____
0.15 "	5	10.5	10.3	7.5	MKP4D031502E00_____	5	10.5	10.3	7.5	MKP4F031502E00_____
	5	11	13	10	MKP4D031503F00_____	5	11	13	10	MKP4F031503F00_____
0.22 "	6	12	13	10	MKP4D032203G00_____	6	12	13	10	MKP4F032203G00_____
	5	11	18	15	MKP4D032204B00_____	5	11	18	15	MKP4F032204B00_____
0.33 "	6	12.5	18	15	MKP4D033304C00_____	6	12.5	18	15	MKP4F033304C00_____
0.47 "	7	14	18	15	MKP4D034704D00_____	7	14	18	15	MKP4F034704D00_____
0.68 "	8	15	18	15	MKP4D036804F00_____	8	15	18	15	MKP4F036804F00_____
	6	15	26.5	22.5	MKP4D036805B00_____	6	15	26.5	22.5	MKP4F036805B00_____
1.0 μ F	7	16.5	26.5	22.5	MKP4D041005D00_____	7	16.5	26.5	22.5	MKP4F041005D00_____
1.5 "	10.5	19	26.5	22.5	MKP4D041505G00_____	10.5	19	26.5	22.5	MKP4F041505G00_____
2.2 "	11	21	26.5	22.5	MKP4D042205I00_____	11	21	26.5	22.5	MKP4F042205I00_____
	11	21	31.5	27.5	MKP4D042206B00_____	11	21	31.5	27.5	MKP4F042206B00_____
3.3 "	13	24	31.5	27.5	MKP4D043306D00_____	13	24	31.5	27.5	MKP4F043306D00_____
4.7 "	13	24	31.5	27.5	MKP4D044706D00_____	15	26	31.5	27.5	MKP4F044706F00_____
6.8 "	15	26	31.5	27.5	MKP4D046806F00_____	17	29	31.5	27.5	MKP4F046806G00_____
	13	24	41.5	37.5	MKP4D046807C00_____	15	26	41.5	37.5	MKP4F046807D00_____
10 μ F	17	29	41.5	37.5	MKP4D051007E00_____	19	32	41.5	37.5	MKP4F051007F00_____

* AC voltages: $f \leq 400 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

** PCM = Printed circuit module = pin spacing

The high values and large box sizes according to main catalogue 2015 are still available on request.

Dims. in mm.



ϕd	PCM	W
0.5	7.5	≥ 3
0.6	7.5	≥ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
Taped version see page 145.

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Continuation

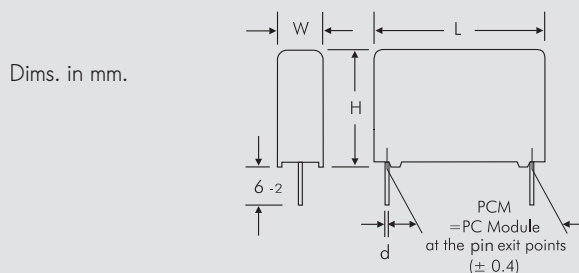
General Data

Capacitance	400 VDC/220 VAC*					630 VDC/280 VAC*					
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number	
0.01 μF	3	8.5	10	7.5	MKP4G021002B00_____	3	8.5	10	7.5	MKP4J021002B00_____	
	0.015 "	4	9	10	7.5	MKP4G021502C00_____	4	9	13	10	MKP4J021003C00_____
		4	9	13	10	MKP4G021503C00_____	4	9	10	7.5	MKP4J021502C00_____
0.022 "	4.5	9.5	10.3	7.5	MKP4G022202D00_____	4.5	9.5	13	10	MKP4J021503C00_____	
	4	9	13	10	MKP4G022203C00_____	4	9	13	10	MKP4J022202D00_____	
0.033 "	5	10.5	10.3	7.5	MKP4G023302E00_____	5	10.5	10.3	7.5	MKP4J022203C00_____	
	4	9	13	10	MKP4G023303C00_____	4	9	13	10	MKP4J022203C00_____	
0.047 "	5	10.5	10.3	7.5	MKP4G024702E00_____	5.7	12.5	10.3	7.5	MKP4J023302E00_____	
	5	11	13	10	MKP4G024703F00_____	5	11	13	10	MKP4J023303C00_____	
0.068 "	5.7	12.5	10.3	7.5	MKP4G026802F00_____	6	12	13	10	MKP4J024702F00_____	
	5	11	13	10	MKP4G026803F00_____	6	12.5	13	10	MKP4J024703F00_____	
0.1 μF	6	12	13	10	MKP4G031003G00_____	7	14	18	15	MKP4J026803G00_____	
	5	11	18	15	MKP4G031004B00_____	6	12.5	18	15	MKP4J026804C00_____	
0.15 "	6	12.5	18	15	MKP4G031504C00_____	8	15	18	15	MKP4J031004D00_____	
	0.22 "	7	14	18	15	MKP4G032204D00_____	6	15	26.5	22.5	MKP4J031504F00_____
9							16	18	15	MKP4J031505B00_____	
0.33 "	8	15	18	15	MKP4G033304F00_____	7	16.5	26.5	22.5	MKP4J032204J00_____	
	6	15	26.5	22.5	MKP4G033305B00_____	8.5	18.5	26.5	22.5	MKP4J032205D00_____	
0.47 "	7	16.5	26.5	22.5	MKP4G034705D00_____	10.5	19	26.5	22.5	MKP4J033305F00_____	
	0.68 "	8.5	18.5	26.5	22.5	MKP4G036805F00_____	11	21	31.5	27.5	MKP4J034705G00_____
11							21	31.5	27.5	MKP4J034706B00_____	
1.0 μF	11	21	26.5	22.5	MKP4G041005I00_____	11	21	31.5	27.5	MKP4J036806B00_____	
	11	21	31.5	27.5	MKP4G041006B00_____	13	24	31.5	27.5	MKP4J041006D00_____	
1.5 "	11	21	31.5	27.5	MKP4G041506B00_____	15	26	31.5	27.5	MKP4J041506F00_____	
2.2 "	15	26	31.5	27.5	MKP4G042206F00_____					17	29
3.3 "	17	29	31.5	27.5	MKP4G043306G00_____	19	32	41.5	37.5	MKP4J042207E00_____	
	17	29	41.5	37.5	MKP4G043307E00_____					MKP4J043307F00_____	
4.7 "	19	32	41.5	37.5	MKP4G044707F00_____	20	39.5	41.5	37.5	MKP4J044707G00_____	
6.8 "	20	39.5	41.5	37.5	MKP4G046807G00_____					24	45.5
10 μF	24	45.5	41.5	37.5	MKP4G051007H00_____	24	45.5	41.5	37.5	MKP4J046807H00_____	
						35	50	41.5	37.5	MKP4J051007J00_____	

* AC voltages: $f \leq 400 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

** PCM = Printed circuit module = pin spacing

The high values and large box sizes according to main catalogue 2015 are still available on request.



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Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J

Packing: bulk = S
Pin length: 6-2 = SD

Taped version see page 145.

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Continuation

General Data

Capacitance	850 VDC/400 VAC*					1000 VDC/400 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP4M011003C00_____	4	9	13	10	MKP4O111003C00_____
1500 "	4	9	13	10	MKP4M011503C00_____	4	9	13	10	MKP4O111503C00_____
2200 "	4	9	13	10	MKP4M012203C00_____	4	9	13	10	MKP4O112203C00_____
3300 "	4	9	13	10	MKP4M013303C00_____	4	9	13	10	MKP4O113303C00_____
4700 "	4	9	13	10	MKP4M014703C00_____	4	9	13	10	MKP4O114703C00_____
6800 "	4	9	13	10	MKP4M016803C00_____	5	11	13	10	MKP4O116803F00_____
0.01 µF	5	11	13	10	MKP4M021003F00_____	5	11	13	10	MKP4O121003F00_____
0.015 "	5	11	13	10	MKP4M021503F00_____	5	11	13	10	MKP4O121503F00_____
	5	11	18	15	MKP4M021504B00_____	5	11	18	15	MKP4O121504B00_____
0.022 "	5	11	18	15	MKP4M022204B00_____	5	11	18	15	MKP4O122204B00_____
0.033 "	6	12.5	18	15	MKP4M023304C00_____	6	12.5	18	15	MKP4O123304C00_____
0.047 "	7	14	18	15	MKP4M024704D00_____	7	14	18	15	MKP4O124704D00_____
0.068 "	8	15	18	15	MKP4M026804F00_____	8	15	18	15	MKP4O126804F00_____
	6	15	26.5	22.5	MKP4M026805B00_____	6	15	26.5	22.5	MKP4O126805B00_____
0.1 µF	9	16	18	15	MKP4M031004J00_____	9	16	18	15	MKP4O131004J00_____
	7	16.5	26.5	22.5	MKP4M031005D00_____	7	16.5	26.5	22.5	MKP4O131005D00_____
0.15 "	8.5	18.5	26.5	22.5	MKP4M031505F00_____	8.5	18.5	26.5	22.5	MKP4O131505F00_____
0.22 "	11	21	26.5	22.5	MKP4M032205I00_____	11	21	26.5	22.5	MKP4O132205I00_____
	11	21	31.5	27.5	MKP4M032206B00_____	11	21	31.5	27.5	MKP4O132206B00_____
0.33 "	11	21	31.5	27.5	MKP4M033306B00_____	11	21	31.5	27.5	MKP4O133306B00_____
0.47 "	13	24	31.5	27.5	MKP4M034706D00_____	13	24	31.5	27.5	MKP4O134706D00_____
0.68 "	17	29	31.5	27.5	MKP4M036806G00_____	17	29	31.5	27.5	MKP4O136806G00_____
1.0 µF	17	29	41.5	37.5	MKP4M041007E00_____	17	29	41.5	37.5	MKP4O141007E00_____
1.5 "	20	39.5	41.5	37.5	MKP4M041507G00_____	20	39.5	41.5	37.5	MKP4O141507G00_____
2.2 "	24	45.5	41.5	37.5	MKP4M042207H00_____	24	45.5	41.5	37.5	MKP4O142207H00_____
3.3 "	31	46	41.5	37.5	MKP4M043307I00_____	31	46	41.5	37.5	MKP4O143307I00_____
4.7 "	35	50	41.5	37.5	MKP4M044707J00_____	35	50	41.5	37.5	MKP4O144707J00_____

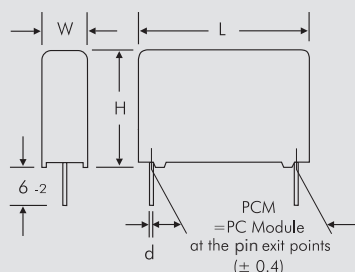
* AC voltages: $f \leq 400 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

New values and range

** PCM = Printed circuit module = pin spacing

The high values and large box sizes according to main catalogue 2015 are still available on request.

Dims. in mm.



ø d	PCM	W
0.5	7.5	= 3
0.6	7.5	≥ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

Part number completion:

Tolerance: 20 % = M
10 % = K
5 % = J
Packing: bulk = S
Pin length: 6-2 = SD
Taped version see page 145.

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Continuation

General Data

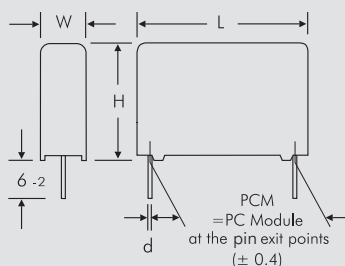
Capacitance	1600 VDC/630 VAC*					2000 VDC/700 VAC*				
	W	H	L	PCM**	Part number	W	H	L	PCM**	Part number
1000 pF	4	9	13	10	MKP4T011003C00_____	4	9	13	10	MKP4U011003C00_____
1500 "	4	9	13	10	MKP4T011503C00_____	4	9	13	10	MKP4U011503C00_____
2200 "	4	9	13	10	MKP4T012203C00_____	4	9	13	10	MKP4U012203C00_____
3300 "	4	9	13	10	MKP4T013303C00_____	4	9	13	10	MKP4U013303C00_____
4700 "	4	9	13	10	MKP4T014703C00_____	4	9	13	10	MKP4U014703C00_____
6800 "	5	11	13	10	MKP4T016803F00_____	5	11	13	10	MKP4U016803F00_____
						5	11	18	15	MKP4U016804B00_____
0.01 µF	5	11	13	10	MKP4T021003F00_____	6	12.5	18	15	MKP4U021004C00_____
0.015 "	5	11	18	15	MKP4T021504B00_____	7	14	18	15	MKP4U021504D00_____
0.022 "	6	12.5	18	15	MKP4T022204C00_____	8	15	18	15	MKP4U022204F00_____
0.033 "	7	14	18	15	MKP4T023304D00_____	9	16	18	15	MKP4U023304J00_____
	6	15	26.5	22.5	MKP4T023305B00_____	6	15	26.5	22.5	MKP4U023305B00_____
0.047 "	9	16	18	15	MKP4T024704J00_____	7	16.5	26.5	22.5	MKP4U024705D00_____
	6	15	26.5	22.5	MKP4T024705B00_____					
0.068 "	7	16.5	26.5	22.5	MKP4T026805D00_____	8.5	18.5	26.5	22.5	MKP4U026805F00_____
0.1 µF	8.5	18.5	26.5	22.5	MKP4T031005F00_____	11	21	26.5	22.5	MKP4U031005I00_____

* AC voltages: $f \leq 400 \text{ Hz}$; $1.4 \times U_{\text{rms}} + U_{\text{DC}} \leq U_r$

New ranges

** PCM = Printed circuit module = pin spacing

Dims in mm



Ø d	PCM	W
0.5	7.5	= 3
0.6	7.5	≥ 4
0.6	10	
0.8	15 - 27.5	
1.0	37.5	

Part number completion:

Tolerance: 20 % = M

10 % = K

5 % = J

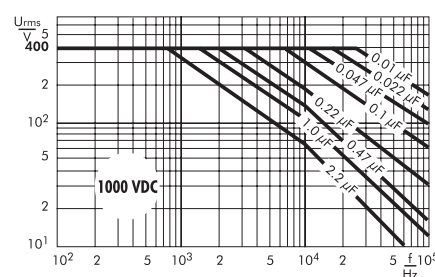
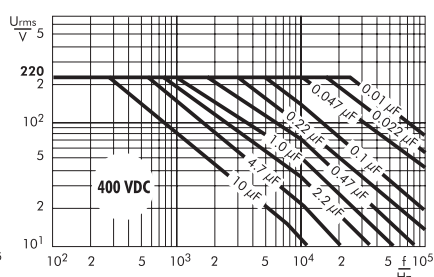
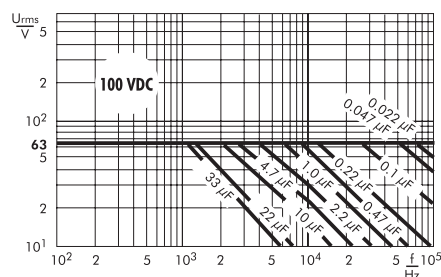
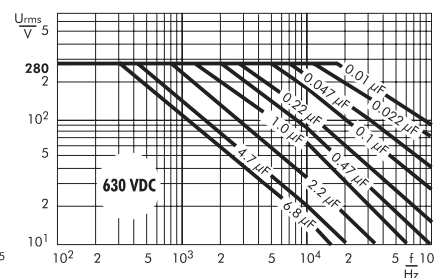
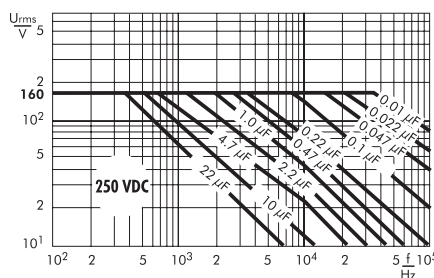
Packing: bulk = S

Pin length: 6-2 = SD

Taped version see page 145.

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Permissible AC voltage
in relation to frequency
at 10° C internal temperature rise
(general guide).



Recommendation for Processing and Application of Through-Hole Capacitors

Soldering Process

Internal temperature of the capacitor must be kept as follows:

Polyester: preheating: $T_{\max.} \leq 125^{\circ}\text{C}$
soldering: $T_{\max.} \leq 135^{\circ}\text{C}$

Polypropylene: preheating: $T_{\max.} \leq 100^{\circ}\text{C}$
soldering: $T_{\max.} \leq 110^{\circ}\text{C}$

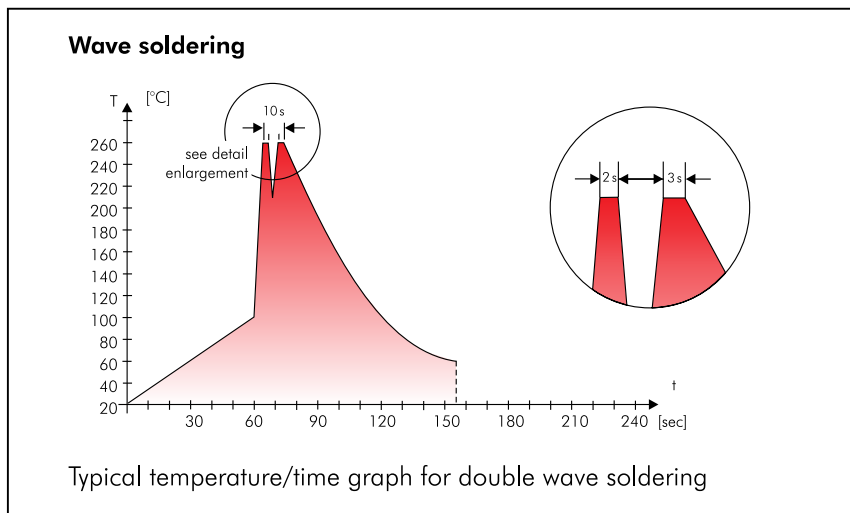
Single wave soldering

Soldering bath temperature: $T < 260^{\circ}\text{C}$
Dwell time: $t < 5\text{ sec}$

Double wave soldering

Soldering bath temperature: $T < 260^{\circ}\text{C}$
Dwell time: $\Sigma t < 5\text{ sec}$

Due to different soldering processes and heat requirements the graphs are to be regarded as a recommendation only.



WIMA Quality and Environmental Philosophy

ISO 9001:2008 Certification

ISO 9001:2008 is an international basic standard of quality assurance systems for all branches of industry. The approval according to ISO 9001:2008 of our factories by the infaz (Institut für Auditierung und Zertifizierung) certifies that organisation, equipment and monitoring of quality assurance in our factories correspond to internationally recognized standards.

WIMA WPCS

The WIMA Process Control System (WPCS) is a quality surveillance and optimization system developed by WIMA. WPCS is a major part of the quality-oriented WIMA production. Points of application during production process:

- incoming material inspection
- metallization
- film inspection
- schoopage
- pre-healing
- pin attachment
- cast resin preparation/encapsulation
- 100% final inspection
- Testing as per customer requirements

WIMA Environmental Policy

All WIMA capacitors, irrespective of whether through-hole devices or SMD, are made of environmentally friendly materials. Neither during manufacture nor in the product itself any toxic substances are used, e.g.

- | | |
|------------------------|------------|
| – Lead | – PBB/PBDE |
| – PCB | – Arsenic |
| – CFC | – Cadmium |
| – Hydrocarbon chloride | – Mercury |
| – Chromium 6+ | – etc. |

We merely use pure, recyclable materials for packing our components, such as:

- carton
- cardboard
- adhesive tape made of paper
- polystyrene

We almost completely refrain from using packing materials such as:

- foamed polystyrene (Styropor®)
- adhesive tapes made of plastic
- metal clips

RoHS Compliance

According to the RoHS Directive 2011/65/EU certain hazardous substances like e.g. lead, cadmium, mercury must not be used any longer in electronic equipment as of July 1st, 2006. For the sake of the environment WIMA has refrained from using such substances since years already.



WIMA Kondensatoren sind bleifrei
konform RoHS 2011/65/EU

WIMA capacitors are lead free
in accordance with RoHS 2011/65/EU

Tape for lead-free WIMA capacitors

DIN EN ISO 14001:2004

WIMA's environmental management has been established in accordance with the guidelines of DIN EN ISO 14001:2004 to optimize the production processes with regard to energy and resources.

Typical Dimensions for Taping Configuration

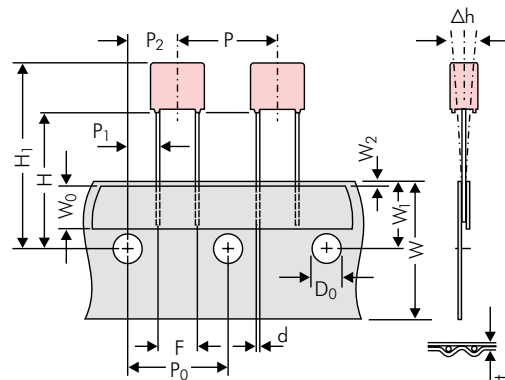


Diagram 1:
PCM 2.5/5/7.5mm

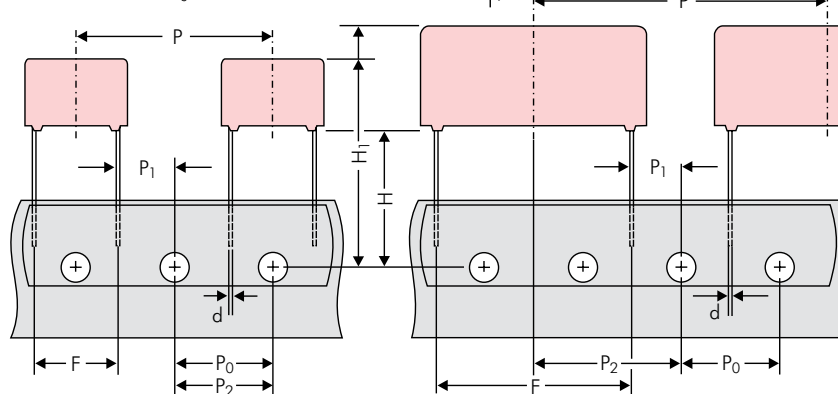


Diagram 2: PCM 10/15 mm

Diagram 3: PCM 22.5 and 27.5*mm

*PCM 27.5 taping possible with two feed holes between components

Designation	Symbol	Dimensions for Radial Taping						
		PCM 2.5 taping	PCM 5 taping	PCM 7.5 taping	PCM 10 taping*	PCM 15 taping*	PCM 22.5 taping	PCM 27.5 taping
Carrier tape width	W	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5	18.0 ±0.5
Hold-down tape width	W ₀	6.0 for hot-sealing adhesive tape	6.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape	12.0 for hot-sealing adhesive tape
Hole position	W ₁	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5	9.0 ±0.5
Hold-down tape position	W ₂	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.	0.5 to 3.0 max.
Feed hole diameter	D ₀	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2	4.0 ±0.2
Pitch of component	P	12.7 ±1.0	12.7 ±1.0	12.7 ±1.0	25.4 ±1.0	25.4 ±1.0	38.1 ±1.5	38.1 ±1.5 or 50.8 ±1.5
Feed hole pitch	P ₀	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch	12.7 ±0.3 cumulative pitch error max. 1.0 mm/20 pitch
Feed hole centre to pin	P ₁	5.1 ±0.5	3.85 ±0.7	2.6 ±0.7	7.7 ±0.7	5.2 ±0.7	7.8 ±0.7	5.3 ±0.7
Hole centre to component centre	P ₂	6.35 ±1.3	6.35 ±1.3	6.35 ±1.3	12.7 ±1.3	12.7 ±1.3	19.05 ±1.3	19.05 ±1.3
Feed hole centre to bottom edge of the component	H	16.5 ±0.3 18.5 ±0.5	16.5 ±0.3 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5	16.5 ±0.5 18.5 ±0.5
Feed hole centre to top edge of the component	H ₁	H+H _{component} < H ₁ 32.25 max.	H+H _{component} < H ₁ 32.25 max.	H+H _{component} < H ₁ 24.5 to 31.5	H+H _{component} < H ₁ 25.0 to 31.5	H+H _{component} < H ₁ 26.0 to 37.0	H+H _{component} < H ₁ 30.0 to 43.0	H+H _{component} < H ₁ 35.0 to 45.0
Pin spacing at upper edge of carrier tape	F	2.5 ±0.5	5.0 ^{+0.8} _{-0.2}	7.5 ±0.8	10.0 ±0.8	15 ±0.8	22.5 ±0.8	27.5 ±0.8
Pin diameter	d	0.4 ±0.05	0.5 ±0.05	0.5 ±0.05 or 0.6 ^{+0.06} _{-0.05}	0.5 ±0.05 or 0.6 ^{+0.06} _{-0.05}	0.8 ^{+0.08} _{-0.05}	0.8 ^{+0.08} _{-0.05}	0.8 ^{+0.08} _{-0.05}
Component alignment	Δh	± 2.0 max.	± 2.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.	± 3.0 max.
Total tape thickness	t	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2	0.7 ±0.2
Package (see also page 146)		ROLL/AMMO			AMMO			
		REEL ø 360 max. ø 30 ±1	B 52 ±2 58 ±2 } depending on comp. dimensions		REEL ø 360 max. ø 30 ±1	B 52 ±2 58 ±2 or 66 ±2	REEL ø 500 max. ø 25 ±1	B 54 ±2 60 ±2 or 68 ±2 } depending on PCM and component dimensions
Unit		see details page 147.						

Dims in mm.

* Diameter of pins see General Data.

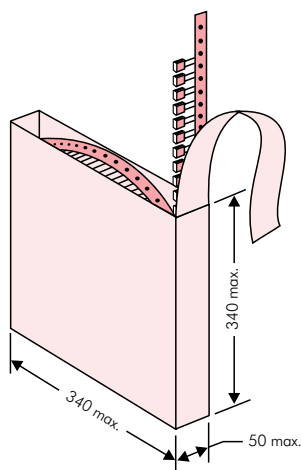
Please clarify customer-specific deviations with the manufacturer.

* PCM 10 and PCM 15 can be crimped to PCM 7.5.

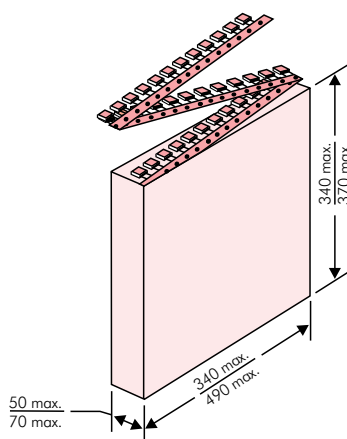
Position of components according to PCM 7.5 (sketch 11). P₀ = 12.7 or 15.0 is possible

Types of Tape Packaging of Capacitors for Automatic Radial Insertion

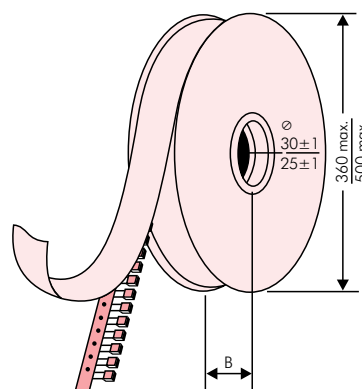
■ ROLL Packaging



■ AMMO Packaging



■ REEL Packaging



BAR CODE (Labelling)

Labelling of package units in plain text and with alphanumerical Bar Code

Scanner decoding of

- WIMA supplier number
- Customer's P/O number
- Customer's part number
- WIMA confirmation number
- WIMA part number
- Lot number
- Date code
- Quantity

In addition part description of

- article
- capacitance value
- rated voltage
- dimensions
- capacitance tolerance
- packing

as well as gross weight and customer's name are indicated in plain text.

WIMA Best Capacitors Made In Germany		Werk Unna	
Supplier-ID: 123456789	RoHS 2011/65/EU	Date Code: 08.10.10	
Purchase Order No. (P/O): Bestellung xyz		Quantity: 5.000	
Customer Part No.: KUNDETEILENUMMER		Customer No.: 0000100002	
		Gross Weight [g]: 1870	
WIMA Confirmation No.: 0001004053000100		WIMA Part No.: MKS2C034701C00K89D	
Handling Unit:	MKS 2	QTY: 5.000	COO: DE
	MKS 2 0.47 µF 63 VDC 3.5x8.5x7.2 RM5		
	Standard 10% Loss - Standard		Drühte 6-2
1000067326	Vorlage Debitur Inland		Week 03/2011

BARCODE „Code 39“

Packing Quantities for Capacitors with Radial Pins in PCM 2.5 mm to 22.5 mm

PCM	Size				bulk	pcs. per packing unit									
						ROLL		REEL		AMMO					
	H16.5	H18.5	ø 360	ø 500		340 × 340	490 × 370								
	W	H	L	Codes	S	N	O	F	I	H	J	A	C	B	D
2.5 mm	2.5	7	4.6	0B	5000	2200		2500		–		2800		–	
	3	7.5	4.6	0C	5000	2000		2300		–		2300		–	
	3.8	8.5	4.6	0D	5000	1500		1800		–		1800		–	
	4.6	9	4.6	0E	5000	1200		1500		–		1500		–	
	5.5	10	4.6	0F	5000	900		1200		–		1200		–	
5 mm	2.5	6.5	7.2	1A	5000	2200		2500		–		2800		–	
	3	7.5	7.2	1B	5000	2000		2300		–		2300		–	
	3.5	8.5	7.2	1C	5000	1600		2000		–		2000		–	
	4.5	6	7.2	1D	6000	1300		1500		–		1500		–	
	4.5	9.5	7.2	1E	4000	1300		1500		–		1500		–	
	5	10	7.2	1F	3500	1100		1400		–		1400		–	
	5.5	7	7.2	1G	4000	1000		1200		–		1200		–	
	5.5	11.5	7.2	1H	2500	1000		1200		–		1200		–	
	6.5	8	7.2	1I	2500	800		1000		–		1000		–	
	7.2	8.5	7.2	1J	2500	700		1000		–		1000		–	
	7.2	13	7.2	1K	2000	700		950		–		1000		–	
	8.5	10	7.2	1L	2000	600		800		–		800		–	
	8.5	14	7.2	1M	1500	600		800		–		800		–	
	11	16	7.2	1N	1000	500		600		–		400		–	
7.5 mm	2.5	7	10	2A	5000	–		2500		4400		2500		–	
	3	8.5	10	2B	5000	–		2200		4300		2300		4150	
	4	9	10	2C	4000	–		1700		3200		1700		3100	
	4.5	9.5	10.3	2D	3500	–		1500		2900		1400		2700	
	5	10.5	10.3	2E	3000	–		1300		2500		1300		–	
	5.7	12.5	10.3	2F	2000	–		1000		2200		1100		–	
	7.2	12.5	10.3	2G	1500	–		900		1800		1000		–	
10 mm	3	9	13	3A	3000	–		1100		2200		–		1900	
	4	8.5	13.5	FA	3000	–		900		1600		–		1450	
	4	9	13	3C	3000	–		900		1600		–		1450	
	4	9.5	13	3D	3000	–		900		1600		–		1400	
	5	10	13.5	FB	2000	–		700		1300		–		1200	
	5	11	13	3F	3000	–		700		1300		–		1200	
	6	12	13	3G	2400	–		550		1100		–		1000	
	6	12.5	13	3H	2400	–		550		1100		–		1000	
	8	12	13	3I	2000	–		400		800		–		740	
15 mm	5	11	18	4B	2400	–		600		1200		–		1150	
	5	13	19	FC	1000	–		600		1200		–		1200	
	6	12.5	18	4C	2000	–		500		1000		–		1000	
	6	14	19	FD	1000	–		500		1000		–		1000	
	7	14	18	4D	1600	–		450		900		–		850	
	7	15	19	FE	1000	–		450		900		–		850	
	8	15	18	4F	1200	–		400		800		–		740	
	8	17	19	FF	500	–		400		800		–		740	
	9	14	18	4H	1200	–		350		700		–		650	
	9	16	18	4J	900	–		350		700		–		650	
	10	18	19	FG	500	–		300		650		–		590	
	11	14	18	4M	1000	–		300		600		–		540	
22.5 mm	5	14	26.5	5A	1200	–		–		800		–		770	
	6	15	26.5	5B	1000	–		–		700		–		640	
	7	16.5	26.5	5D	760	–		–		600		–		550	
	8	20	28	5H	500	–		–		500		–		480	
	8.5	18.5	26.5	5F	500	–		–		480		–		450	
	10	22	28	FI	570*	–		–		420		–		380	
	10.5	19	26.5	5G	594*	–		–		400		–		360	
	10.5	20.5	26.5	5H	594*	–		–		400		–		360	
	11	21	26.5	5I	561*	–		–		380		–		350	
	12	24	28	FJ	480*	–		–		350		–		310	

* TPS (Tray-Packing-System). Plate versions may have different packing units.
Samples and pre-production needs on request.

■ Moulded versions.

Rights reserved to amend design data without prior notification.

Packing Quantities for Capacitors with Radial Pins in PCM 27.5 mm to 52.5 mm

PCM	Size				bulk	ROLL		pcs. per packing unit				AMMO			
								REEL							
	W	H	L	Codes		H16.5	H18.5	ø 360	ø 500	340 x 340	490 x 370	H16.5	H18.5	H16.5	H18.5
					S	N	O	F	I	H	J	A	C	B	D
27.5 mm	9	19	31.5	6A	567*	–	–	–	–	460/340*	–	–	–	420	–
	11	21	31.5	6B	459*	–	–	–	–	380/280*	–	–	–	350	–
	13	24	31.5	6D	378*	–	–	–	–	300	–	–	–	290	–
	13	25	33	FK	405*	–	–	–	–	–	–	–	–	–	–
	15	26	31.5	6F	324*	–	–	–	–	270	–	–	–	250	–
	15	26	33	FL	324*	–	–	–	–	–	–	–	–	–	–
	17	29	31.5	6G	198*	–	–	–	–	–	–	–	–	–	–
	17	34.5	31.5	6I	198*	–	–	–	–	–	–	–	–	–	–
	20	32	33	FM	162*	–	–	–	–	–	–	–	–	–	–
	20	39.5	31.5	6J	162*	–	–	–	–	–	–	–	–	–	–
37.5 mm	9	19	41.5	7A	441*	–	–	–	–	–	–	–	–	–	–
	11	22	41.5	7B	357*	–	–	–	–	–	–	–	–	–	–
	13	24	41.5	7C	294*	–	–	–	–	–	–	–	–	–	–
	15	26	41.5	7D	252*	–	–	–	–	–	–	–	–	–	–
	17	29	41.5	7E	154*	–	–	–	–	–	–	–	–	–	–
	19	32	41.5	7F	140*	–	–	–	–	–	–	–	–	–	–
	20	39.5	41.5	7G	126*	–	–	–	–	–	–	–	–	–	–
	24	45.5	41.5	7H	112*	–	–	–	–	–	–	–	–	–	–
	31	46	41.5	7I	84*	–	–	–	–	–	–	–	–	–	–
	35	50	41.5	7J	35*	–	–	–	–	–	–	–	–	–	–
	40	55	41.5	7K	28*	–	–	–	–	–	–	–	–	–	–
48.5 mm	19	31	56	8D	120*	–	–	–	–	–	–	–	–	–	–
	23	34	56	8E	80*	–	–	–	–	–	–	–	–	–	–
	27	37.5	56	8H	84*	–	–	–	–	–	–	–	–	–	–
	33	48	56	8J	25*	–	–	–	–	–	–	–	–	–	–
	37	54	56	8L	25*	–	–	–	–	–	–	–	–	–	–
52.5 mm	25	45	57	9D	70*	–	–	–	–	–	–	–	–	–	–
	30	45	57	9E	60*	–	–	–	–	–	–	–	–	–	–
	35	50	57	9F	25*	–	–	–	–	–	–	–	–	–	–
	45	55	57	9H	20*	–	–	–	–	–	–	–	–	–	–
	45	65	57	9J	20*	–	–	–	–	–	–	–	–	–	–

* for 2-inch transport pitches.

* TPS (Tray-Packing-System). Plate versions may have different packing units.
Samples and pre-production needs on request.

■ Moulded versions.

Rights reserved to amend design data without prior notification.

Updated data on www.wima.com

A WIMA part number consists of 18 digits and is composed as follows:

Field 1 - 4: Type description
 Field 5 - 6: Rated voltage
 Field 7 - 10: Capacitance
 Field 11 - 12: Size and PCM
 Field 13 - 14: Version code (e.g. Snubber versions)
 Field 15: Capacitance tolerance
 Field 16: Packing
 Field 17 - 18: Pin length (untaped)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	K	S	2	C	0	2	1	0	0	1	A	0	0	M	S	S	D
MKS 2				63 VDC		0.01 μF				2.5x6.5x7.2		-		20%	bulk	6 -2	
Type description:				Rated voltage:		Capacitance:				Size:		Tolerance:		Packing:			
SMD-PET = SMDT				50 VDC = B0		22 pF = 0022				4.8x3.3x3 Size 1812 = KA		±20% = M		AMMO H16.5 340x340 = A			
SMD-PEN = SMDN				63 VDC = C0		47 pF = 0047				4.8x3.3x4 Size 1812 = KB		±10% = K		AMMO H16.5 490x370 = B			
SMD-PPS = SMDI				100 VDC = D0		100 pF = 0100				5.7x5.1x3.5 Size 2220 = QA		±5% = J		AMMO H18.5 340x340 = C			
FKP 02 = FKPO				250 VDC = F0		150 pF = 0150				5.7x5.1x4.5 Size 2220 = QB		±2.5% = H		AMMO H18.5 490x370 = D			
MKS 02 = MKS0				400 VDC = G0		220 pF = 0220				7.2x6.1x3 Size 2824 = TA		±1% = E		REEL H16.5 360 = F			
FKS 2 = FKS2				450 VDC = H0		330 pF = 0330				7.2x6.1x5 Size 2824 = TB		...		REEL H16.5 500 = H			
FKP 2 = FKP2				520 VDC = H2		470 pF = 0470				10.2x7.6x5 Size 4030 = VA				REEL H18.5 360 = I			
FKS 3 = FKS3				600 VDC = I0		680 pF = 0680				12.7x10.2x6 Size 5040 = XA				REEL H18.5 500 = J			
FKP 3 = FK3P				630 VDC = J0		1000 pF = 1100				15.3x13.7x7 Size 6054 = YA				ROLL H16.5 = N			
MKS 2 = MKS2				700 VDC = K0		1500 pF = 1150				2.5x7x4.6 PCM 2.5 = 0B				ROLL H18.5 = O			
MKP 2 = MKP2				800 VDC = L0		2200 pF = 1220				3x7.5x4.6 PCM 2.5 = 0C				BLISTER W12 180 = P			
MKS 4 = MKS4				850 VDC = M0		3300 pF = 1330				2.5x6.5x7.2 PCM 5 = 1A				BLISTER W12 330 = Q			
MKP 4C = MKPC				900 VDC = N0		4700 pF = 1470				3x7.5x7.2 PCM 5 = 1B				BLISTER W16 330 = R			
MKP 4 = MKP4				1000 VDC = O1		6800 pF = 1680				2.5x7x10 PCM 7.5 = 2A				BLISTER W24 330 = T			
MKP 10 = MKP1				1100 VDC = P0		0.01 μF = 2100				3x8.5x10 PCM 7.5 = 2B				Bulk/TPS Standard = S			
FKP 1 = FK1P				1200 VDC = Q0		0.022 μF = 2220				3x9x13 PCM 10 = 3A				...			
MKP-X2 = MKX2				1250 VDC = R0		0.047 μF = 2470				4x9x13 PCM 10 = 3C							
MKP-X1 R = MKX1				1500 VDC = S0		0.1 μF = 3100				5x11x18 PCM 15 = 4B							
MKP-Y2 = MKY2				1600 VDC = T0		0.22 μF = 3220				6x12.5x18 PCM 15 = 4C							
MP 3-X2 = MPX2				2000 VDC = U0		0.47 μF = 3470				5x14x26.5 PCM 22.5 = 5A							
MP 3-X1 = MPX1				2500 VDC = V0		1 μF = 4100				6x15x26.5 PCM 22.5 = 5B							
MP 3-Y2 = MPY2				3000 VDC = W0		2.2 μF = 4220				9x19x31.5 PCM 27.5 = 6A							
MP 3R-Y2 = MPRY				4000 VDC = X0		4.7 μF = 4470				11x21x31.5 PCM 27.5 = 6B							
MKP 4F = MKPF				6000 VDC = Y0		10 μF = 5100				9x19x41.5 PCM 37.5 = 7A							
Snubber MKP = SNMP				250 VAC = 0V		22 μF = 5220				11x22x41.5 PCM 37.5 = 7B							
Snubber FKP = SNFP				275 VAC = 1W		47 μF = 5470				19x31x56 PCM 48.5 = 8D							
GTO MKP = GTOM				300 VAC = 2W		100 μF = 6100				25x45x57 PCM 52.5 = 9D							
DC-LINK MKP 3 = DCP3				305 VAC = AV		220 μF = 6220				...							
DC-LINK MKP 4 = DCP4				350 VAC = BV		1000 μF = 7100											
DC-LINK MKP 4S = DCP5				440 VAC = 4W		1500 μF = 7150											
DC-LINK MKP 5 = DCP5				500 VAC = 5W		...											
DC-LINK MKP 6 = DCP6				...													
DC-LINK HC = DCHC																	
DC-LINK HY = DCHY																	